

## CLAIMS

What is claimed is:

- 5    1. A document counterfeit mechanism, a document including a major document image and a counterfeit protection image, comprising:
  - providing an optical curve body and a base disposed under the optical curve body in order to form a one-piece main body of the document, wherein the major document image is placed on the base;
  - 10    providing an optical decoding piece substantially equivalent to a first optical function for confirming the genuineness of the document when the counterfeit protection image has been viewed through the incorporation of the optical curve body and the optical decoding piece;
  - 15    deriving a second optical function from the first optical function, wherein the second optical function is an inverse function of the first optical function;
  - 20    processing the counterfeit protection image through the second optical function in order to generate a corresponding post-encoding counterfeit protection image; and
  - 25    placing the post-encoding counterfeit protection image on the base, wherein the counterfeit protection image is viewed through use of the optical decoding piece.
2. The document anti-counterfeiting mechanism of claim 1, further comprising a step of placing the post-encoding counterfeit protection image on a predetermined region of the base, wherein when the optical decoding piece is

placed on the predetermined region, the counterfeit protection image is visible.

3. The document anti-counterfeiting mechanism of claim 2, further comprising a step of employing the optical decoding piece with a predetermined side thereof and a predetermined angle while viewing, wherein when the optical decoding piece has been placed on the predetermined region the counterfeit protection image is visible.  
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4. The document anti-counterfeiting mechanism of claim 1, further comprising a step of providing the optical curve body substantially equivalent to a third optical function.  
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5. The document anti-counterfeiting mechanism of claim 4, further comprising a step of having the major document image still in a visually recognizable state after being converted by the third optical function.  
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6. The document anti-counterfeiting mechanism of claim 4, wherein the counterfeit protection image converted by the second and the third optical functions is only visible through further use of the optical decoding piece.  
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7. The document anti-counterfeiting mechanism of claim 4, further comprising a step of matching the second optical function with the third optical function.
8. A counterfeit protection document comprising:  
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an optical curve body and a base located beneath the optical curve body, wherein the optical curve body and the base are monolithically formed;

a major document image placed on the base; and  
a counterfeit protection image placed on a predetermined region of the base;  
wherein the counterfeit protection image is rendered visible in the predetermined  
region of the base by incorporation of an optical decoding piece.

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9. The document of claim 8, wherein the counterfeit protection image placed on the predetermined region of the base is an outcome of processing an original counterfeit protection image by an inverse function of an equivalent optical function of the optical decoding piece.

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10. The document of claim 8, wherein the major document image is still in a visually recognizable state when viewed through the optical curve body.

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11. The document of claim 8, wherein a marking distribution of the optical decoding piece is in a spiral, a concentric, or a multi-circular pattern.

12. The document of claim 11, wherein a marking distribution of the optical decoding piece is a combinations of two or all three of the spiral, the concentric, and the multi-circular patterns.

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13. The document of claim 8, wherein the optical decoding piece is of a phase-type or an amplitude-type optical decoding piece.

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14. The document of claim 8, wherein the optical curve body is implemented with a semi-cylindrical lens array.

15. The document of claim 8, wherein the optical curve body is implemented with a cylindrical lens array.

16. The document of claim 8, wherein the curvature of the optical curve body is  
5 non-uniform.

17. The document of claim 8, wherein the optical curve body is implemented with a spherical lens array.

10 18. The document of claim 8, wherein the optical curve body is implemented with a hemispherical lens array.

19. A counterfeit protection document comprising:

an optical curve body and a base disposed beneath the optical curve body,  
15 wherein the optical curve body and the base are monolithically formed  
together; and

a counterfeit protection image placed in a predetermined region of the base;  
wherein the counterfeit protection image is rendered visible in the predetermined  
region of the base through use of an optical decoding piece.

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20. The document of claim 19, wherein the counterfeit protection image is the outcome of processing an original counterfeit protection image by an inverse function of an equivalent optical function of the optical decoding piece.

25 21. The document of claim 19, further comprising a major image, wherein the major image is still in a visually recognizable state when viewed through the optical

curve body.

22. The document of claim 19, wherein a marking distribution of the optical decoding piece is a spiral, a concentric or a multi-circular pattern.

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23. The document of claim 22, wherein the marking distribution of the optical decoding piece is combinations of two or three of the spiral, the concentric, and the multi-circular patterns.

- 10 24. The document of claim 19, wherein the optical decoding piece is of a phase-type or an amplitude-type optical decoding piece.

25. A document counterfeit protection mechanism comprising:

providing a counterfeit protection image;

- 15 providing an optical encoding function for encoding the counterfeit protection image;

providing an optical curve body and a base beneath the optical curve body, wherein the base and the optical curve body are monolithically formed together, distributing the encoded counterfeit protection image on the base; and

- 20 providing an optical decoding function incorporated with the optical curve body for decoding the encoded counterfeit protection image on the base, wherein the optical decoding function is an inverse function of the optical encoding function.

26. The mechanism of claim 25, further comprising a step of providing an optical

- 25 decoding piece having an optical function substantially equivalent to the optical decoding function.

27. The mechanism of claim 26, further comprising a step of having the encoded  
counterfeit protection image placed on a predetermined region of the base,  
wherein the counterfeit protection image is rendered visible when the optical  
decoding piece is placed on the predetermined region.  
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28. The mechanism of claim 27, further comprising a step of employing the optical  
decoding piece with a predetermined side thereof and a predetermined angle, in  
order to discover the counterfeit protection image when the optical decoding  
piece is placed on the predetermined region.  
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29. The mechanism of claim 26, further comprising the counterfeit protection image  
being invisible without using the optical decoding piece after the counterfeit  
protection image is converted by the optical encoding function and an optical  
function of the optical curve body.  
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30. The mechanism of claim 25, further comprising the optical encoding function  
and the optical function of the optical curve body being mutually matched.  
31. The mechanism of claim 25, further comprising a step of placing a major image  
on the base.  
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